

- edge keeled throughout *O. belangeri*
- Anal fin with more than 20 branched rays. Abdominal edge keeled only between pelvic and anal fins 3
- 3. L.L. 42 - 60, scales between L.L. and pelvic fin 7-9.5, anal fin with 25 - 31 branched rays *O. cotio cunma*
- L.L. 58-70, scales between LL and pelvic fin 10.5-13. Anal fin with 28-33 branched rays *O. cotio cotio*
- L.L. 76-83, scales between L.L. and pelvic fin 13-17, anal fin with 23-25 branched rays *O. bhimensis* sp. nov.
- 4. Four well defined barbels 5
- Two rudimentary maxillary barbels only 7
- 5. Anal fin with more than 20 branched rays. L.L. scales more than 60 *O. feae*
- Anal fin with less than 20 rays. L.L. scales less than 60 6
- 6. L.L. scales 59, 17 branched rays in anal fin *O. neilli*
- L.L. scales 44, 11 branched rays in anal fin *O. bakeri*
- 7. L.L. scales 73-85. Anal fin with 21-27 branched rays *O. vigorsii*
- L.L. scales 86-70. Anal fin with 16-18 branched rays *O. dayi*

Fig. 2. Urohyal in *O. bhimensis* and *O. vigorsii*.

KEY TO THE SPECIES (MODIFIED) FROM HORA & MISRA (1940)

- 1. Barbels absent 2
- Barbels present 4
- 2. Anal fin with less than 20 branched rays. Abdominal

REFERENCES

DAY, F. (1989): The fauna of British India including Ceylon and Burma. Fishes. Vol.1. London.

HORA, S.K. & MISRA, K.S. (1940): Notes on fishes in the Indian Museum. XL. On fishes of the genus *Rohtee*

Sykes. *Rec Indian Mus.* 42: 155-173.

JAYARAM, K.C.(1981): The freshwater fishes of India, Pakistan, Bangladesh, Burma and Sri Lanka — A Handbook. ZSI, Calcutta.

FIRST REPORT OF THE FAMILY VAEJOVIDAE (SCORPIONIDAE : ARACHNIDA) IN MADHYA PRADESH, WITH THE DESCRIPTION OF A NEW SPECIES *SCORPIOPS (SCORPIOPS) PACHMARHICUS*¹

DESHABHUSHAN BASTAWADE²
(With eight text-figures)

Scorpions of the family Vaejovidae are known from 23 nominal species from Indian

subcontinent (Tikader and Bastawade 1976, 1983). All known species have been described under the genus *Scorpiops* Peters 1861 by splitting up this genus into three sub-genera, namely *Scorpiops* Peters (typical), *Euscorpiops* Vachon

¹Accepted September 1991.
²Zoological Survey of India, Arunachal Pradesh Field Station, Itanagar 791 111.

and *Neoscorpions* Vachon. The first two sub-genera are widely distributed in the Himalaya from Kashmir to Arunachal Pradesh; while the third sub-genus is known to occur in a few areas in the Western Ghats, from Maharashtra and Gujarat (Fig. 1). This family remained unreported from Aravalli and Satpura ranges in central India; Western Ghats in Karnataka; Nilgiri, Anamalai, Cardamom and Nallamalai hills in southern India and also from Mahendra hills and Malayagiri in south-eastern India. The family requires revision (Francke 1976, Vachon 1973, 1980). A thorough exploration is also desirable throughout the central and southern parts of the country by scorpionologists to determine its distributional boundaries and to study speciation trend.

Recently some specimens of this family were collected from Pachmarhi (410 m above sea level), Madhya Pradesh for the first time. These specimens show close resemblance with a known species *Scorpiops (Scorpiops) montanus* Pocock in their general appearance. *S. (S.) montanus* Pocock is a widely distributed species in Western Himalaya and commonly occurs at Jaunsar, Kasauli and Dharmasala (type locality) in Punjab and Uttar Kashi, Tehri, Dehra Dun, Pauri, Almora and Nainital in Uttar Pradesh (Tikader and Bastawade 1983). There are no authentic records for the occurrence of this family between Nainital, Uttar Pradesh and Pachmarhi, Madhya Pradesh. Detailed study of the specimens collected from Pachmarhi suggest that they belong to a new species under the sub-genus *Scorpiops* Peters. This communication describes and illustrates the new species.

***Scorpiops (Scorpiops) pachmarhicus* sp. nov.**

(Figs. 2-8)

General: Scorpions of small to medium body size, yellowish to brown in colour; chelicera darker on fingers; pedipalp dark brown and darker on carinae; legs yellowish; carapace, mesosoma and metasoma light brown except yellow telson; ventral portion yellowish, body

surface almost entirely smooth, pectines poorly developed.

Measurements: Female (Holotype), total body length 34.50 mm; carapace 5.25 mm long, mesosoma 14.50 mm long; metasoma 15.75 mm long.

Carapace: Entirely smooth, without carinae, anterior median, posterior median and posterior lateral furrows distinct, margins smooth and anterior margin deeply incised; ocular tubercles poorly developed, smooth, a pair of median eyes anteriorly situated in the ratio 1 : 1.75 as in Fig. 2, three lateral eyes, anterior two larger than the remaining as in Fig. 3.

Mesosoma: Tergites I-VI almost entirely smooth, except weakly and much sparsely granular on posterior portions of tergites IV-VI; pretergal portion of each tergite including all margins smooth; tergite VII smooth, with two pairs of weakly granular carinae, present only on posterior portion, pretergal portion and margins smooth; sternites III-VII entirely smooth, presternal portions and margins smooth; sternites III-VI each provided with a pair of slit-like stigmata for book lungs.

Metasoma: Cauda three times as long as carapace; basal segment always wider than long, all ten carinae distinct and weakly crenulate; segments II-IV with eight carinae poorly granular to obsolete, dorsals ending posteriorly into weak spiniform tubercles, laterals present only on one third posterior portion of segments II and III, intercarinal portion almost smooth except weakly granular dorsal portion; segment V shorter than carapace, a pair of inferiors and a single inferior median carinae poorly granular, anal rim of this segment weakly and sparsely crenulate as in Fig. 4; telson longer than segment V but shorter than carapace; vesicle as long as segment IV and as wide as deep as segment V; smooth, setation as in Fig. 4; aculeus less than half the vesicular length, not much curved, reddish and sharply pointed as in Fig. 4.

Appendages: Chelicera small, basal segment smooth, brownish reticulation on dorsal

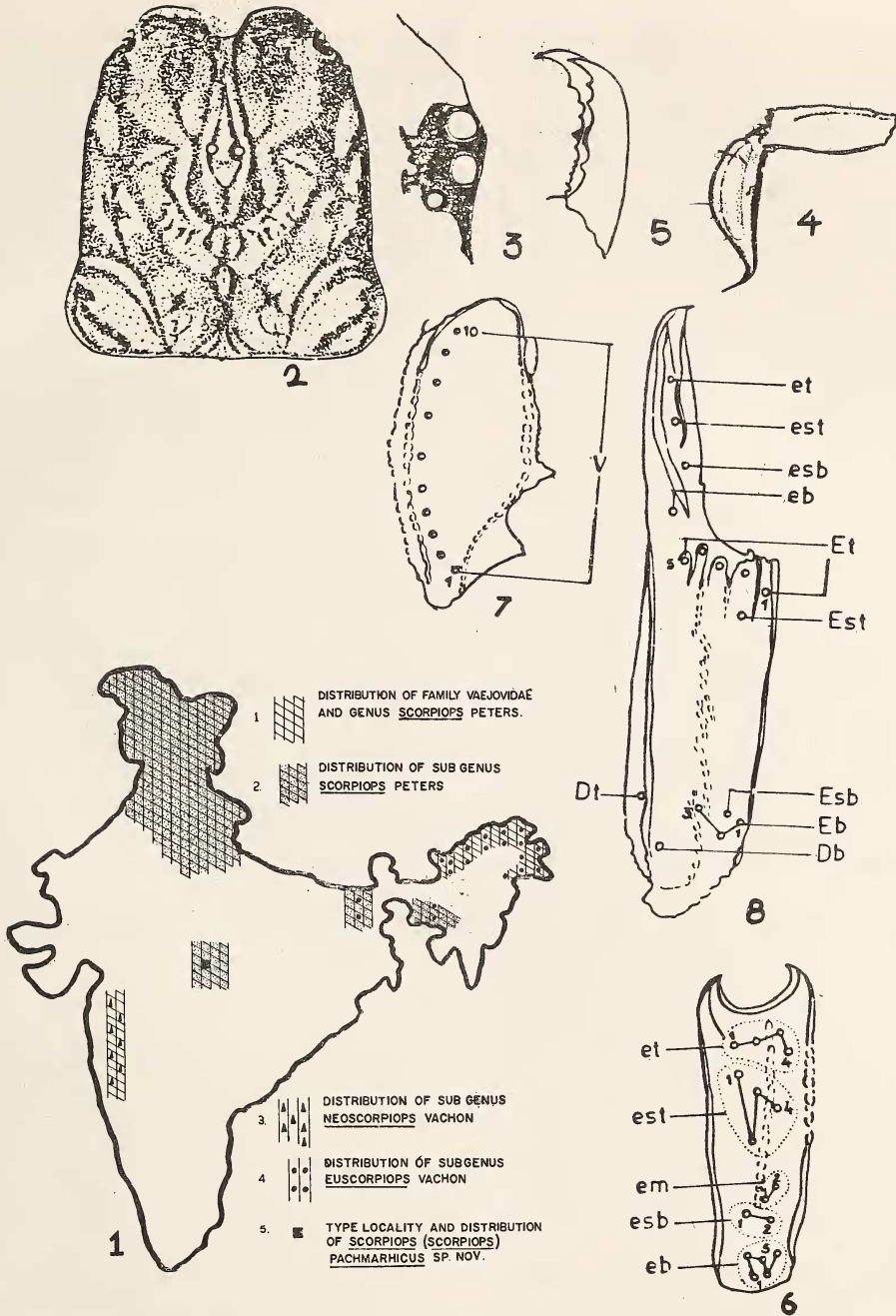


Fig. 1. Map of India, showing distribution of Family Vaejoividae and its genus and subgenera.

Figs. 2-8. *Scorpius* (*Scorpiops*) *pachmarhicus* sp. nov.

2. Dorsal view of carapace, 3. Lateral view of carapace, showing lateral eyes, 4. Interior view of movable finger of chelicera, 5. Lateral view of telson, 6. Exterior view of tibia, 7. Ventral view of tibia, 8. Dorso-exterior view of manus.

portion, fingers dark brown, toothed normally and inferior fang of moveable finger provided with 8-9 minute teeth on interior margin as in Fig. 5; distal tooth larger. Pedipalp stout and strong, not much flat, carinated; femur shorter than carapace, carinated, all four carinae granular but inner carinae much more sparsely granular, anterior or outer surface with two short tubercles; tibia as long as femur but shorter than carapace, carinated, posterior or outer carinae smooth and nearly obsolete, anterior or inner surface with three to four strong basal tubercles; manus flat, much larger than femur but as long as carapace, wider than femur as well as tibia, carinated and all carinae weakly granular on proximal portion and obsolete distally, intercarinal space sparsely but coarsely granular on inner portion while finely granular on dorsal portion, fingers smooth, with few obsolete carinae, immovable finger shorter than femur but movable finger as long as tibia, dentition on fingers arranged in finely granular, double lined, supported with distinct patches of scars at intervals. Trichobothrial patterns on femur, tibia, manus and immovable finger typical for family, genus and sub-genus as in Figs. 6-8 but differ in the number of ventrals (10) on tibia as in Fig. 7. and some relative positions of Eb2 to Eb1 on tibia and Dt to Eb3 on manus as in Figs. 6 and 8. Legs I-IV almost entirely smooth except crenulated anterior carinae on femur, laterally flat, tarsomere II provided with a median line of minute spines, spine formula on leg I-VI : $\frac{6}{6}$, $\frac{5}{6}$, $\frac{6}{8}$, $\frac{7}{8}$. Genital operculum wider than long, sclerites fused medially in female while separated on posterior portion in male, a small genital papillae visible; pectines twice as long as wide, weakly developed, middle lamellae and falcra undistinguished, pectinal teeth 6/6 in female while 7/7 in male.

Material examined: Holotype 1 female, Paratype 2 females, Allotype 1 male mature; collected from Pachmarhi (410 m above sea level in Mahadev Hills of Satpura (22° 60' N, 78° 50' E), Madhya Pradesh. Collected by

Dr. D.F. Singh, ZSI, WRS, Poona, August 1985 and October 1987. The type specimens have been deposited in the National Collection, Z.S.I. Calcutta.

This species closely resembles *Scorpiops* (*Scorpiops*) *montanus* Pocock (Tikader and Bastawade 1983) in appearance but differs from it as follows. (1) A pair of median eyes anteriorly situated in the ratio 1 : 1.75 whereas in *S. (S.) montanus* the ratio is 1 : 2. (2) Carapace and tergites almost entirely smooth whereas in *montanus* they are coarsely granular on lateral portions. (3) Inferior inner margin of movable finger of chelicera provided with 8-9 minute teeth whereas in *montanus* there are 6 teeth. (4) Metasomal segments II-IV with weakly granular and poorly spiniform dorsal carinae whereas in *montanus* dorsal carinae are strongly crenulate and spiniform posteriorly. (5) Ventral trichobothria number only 10 whereas in *montanus* they number 13 to 14 on tibia and external basal 2 (Eb2) trichobothria placed proximal to 1 as in Fig. 6, whereas in *montanus* external basal (Eb1) placed proximal to 2 on tibia. (6) Dorsal terminal (Dt) trichobothria on manus placed distal to External basal 3 (Eb3) as in Fig. 8, whereas in *montanus* Dt placed proximal or in same line to Eb3 on manus.

This species is named after the locality from where the specimens were collected.

ACKNOWLEDGEMENTS

I wish to thank Prof. (Dr) M. S. Jairajpuri, Director, Zoological Survey of India, Calcutta, Dr. G.M. Yazdani, Scientist "SE" Officer-in-charge, Zoological Survey of India, Western Regional Station, Pune and P.T. Bhutia, Scientist "SD", Officer-in-charge, Zoological Survey of India, Arunachal Pradesh Field Station, Itanagar for providing me necessary facilities, constant encouragement during the work and suggesting improvements of the manuscript. I am grateful to Dr. D.F. Singh, for collecting the specimens and allowing me to study them at Pune.

REFERENCES

- FRANCKE, O.F. (1976): Redescription of *Parascorpiops montana* Banks (Scorpionida: Vaejovidae). *Ent. News* 87 (3 & 4): 75-85.
- TIKADER, B.K. & BASTAWADE, D.B. (1976): A new species of scorpion of the genus *Scorpiops* Peters (Family Vaejovidae) from India. *J. Bombay nat. Hist. Soc.* 74(1): 140-144.
- TIKADER, B.K. & BASTAWADE, D.B. (1983): Fauna of India : Scorpions, Vol. III: 1-672.
- VACHON, M. (1973): Etude des caracteres utilises pour classer les families et les genres de Scorpions (Arachnides). *Bull. Mus. natn. Hist. Nat.*, Paris, 3 ser. no. 140, zool (104): 857-958.
- VACHON, M. (1980): Essai d'une classification sousgenerique des Scorpions du genre *Scorpiops* Peters 1861 (Arachnida, Scorpionida, Vaejovidae). *Bull. Mus. natn. Hist. Nat.*, Paris, 4 ser., 2, sectn. A. no. 1: 143-160.

ON A NEW SPECIES OF *SINGHIUS* TAKAHASHI (ALEYRODIDAE: HOMOPTERA) WITH A KEY TO INDIAN SPECIES¹

R. SUNDARARAJ AND B. V. DAVID²
(With a text-figure)

Takahashi (1932) erected *Singhius* as a subgenus under the genus *Dialeurodes* for the species *Aleyrodes hibisci* Kotinsky. In 1978 Mound and Halsey elevated it as a full genus. Alexander and David (1990) shifted the species *Aleurotuberculatus russellae* David and Subramaniam to *Singhius* and thereby suggested a new combination. In the present paper a new species is described under this genus from India. A key to the Indian species of *Singhius* is provided.

KEY TO INDIAN SPECIES OF *Singhius* TAKAHASHI

1. Dorsal setae short and capitate 2
- Dorsal setae long and with pointed tips *hibisci* (Kotinsky)
2. Pupal case 1.01-1.06 mm long 0.76-0.81 mm wide; margin with 25 crenulations in 0.1 mm; thoracic tracheal pore region slightly indicated; entire dorsum granulated *russellae* (David & Subramaniam)
- Pupal case 0.79-0.95 mm long and 0.55-0.70 mm wide; margin with 20 crenulations in 0.1 mm; thoracic tracheal pore region distinct; subdorsum only granulated *morindae* sp. nov.

Singhius morindae sp. nov. (Fig. 1)

Pupal case: White with a little wax on

¹Accepted June 1991.

²Fredrick Institute of Plant Protection and Toxicology, Padappai 601 301.

dorsum; elliptical, broadest at the first abdominal segment region; found singly and scattered on the under surface of leaves; 0.79-0.95 mm long and 0.55-0.70 mm wide.

Margin: Regularly crenulate, 20 crenulations in 0.1 mm; anterior and posterior marginal setae 15 μ and 25 μ long respectively. Thoracic and caudal tracheal pores indicated.

Dorsal surface: Dorsal setae capitate, cephalic setae 17.5 μ long, first abdominal setae (broken), eighth abdominal setae 5 μ long, and caudal setae on either side of caudal pore 37.5 μ long. Dorsum with sparsely distributed minute pores; subdorsum with semicircular markings. Submargin with suture-like lines running mesad from margin distinct. Submarginal or subdorsal setae absent.

Vasiform orifice: Subrectangular, wider than long (30-37.5 μ x 45-55 μ); operculum wider than long (15-20 x 30-35 μ) towards caudal end constricted at half its length and somewhat rounded, filling the orifice; lingula concealed. Caudal tracheal furrow funnel-shaped with a constriction at the middle half and at the pore end and with minute irregular markings. Thoracic tracheal furrows not indicated.

Ventral surface: Ventral abdominal setae 17.5 μ long and 32.5 μ apart; caudal and thoracic